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| **Unit Title:** Operations on Rational Numbers | **Pacing (Duration of Unit):** 5 weeks |

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| **Desired Results** |

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| **Transfer Goals (**Priority practice standards in **bold)** |
| *Students will be able to independently use their learning to:*   1. **Make sense of problems and persevere in solving them.** 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. **Model with mathematics.** 5. Use appropriate tools strategically. 6. **Attend to precision.** 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning. |

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| **Established Goals (2011 MA Curriculum Frameworks Standards Incorporating the Common Core State Standards)** |

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| **Prerequisite Standards:**   * 5.NBT.A: Understand the place value system. * 5.NBT.A.2: Explain **patterns in the number of zeros** of the product when multiplying a number by powers of 10, and explain **patterns in the placement of the decimal point** when a decimal is multiplied or divided by a power of 10. **Use whole-number exponents** to denote powers of 10. * 5.NBT.A.3b: Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. * 5.NBT.A.4: Use place value understanding to round decimals to any place. | **WIDA for English Language Learners**  Standard 1: ELLs **communicate** for **Social** and **Instructional** purposes within the school setting  Standard 3: ELLs **communicate** information, ideas and concepts necessary for academic success in the content area of **Mathematics**  In the lesson planning stage, teachers will need to differentiate lessons for ELLs. In order to accomplish this they will need: 1.) this curriculum map, 2.) a list of their ELLs and their proficiency levels, and 3.) appropriate language function expectations and scaffolds or supports. |
| **Standards (**Priority Standards in **bold):**   * 6.NS.1: Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. * 6.NS.2: Fluently divide multi-digit numbers using the standard algorithm. * 6.NS.3: Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. * 6.NS.4: Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4*(*9 + 2*)*.* * 6.NS.MA.4a: Apply number theory concepts, including prime factorization and relatively prime numbers, to the solution of problems. |  |

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| **Meaning (\*Mostly assessed through Performance Tasks/Assessments)** |

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| **Big Ideas:** (Statements and concepts written in teacher-friendly language which reflect the important [but not obvious] generalizations we want students to be able to arrive at. These are used by the teacher to focus daily instruction.)   * Apply and extend previous understandings of multiplication and division to divide fractions by fractions. * Compute fluently with multi-digit numbers, decimals, and find common factors and multiples. * The meanings of each operation on fractions are consistent with the meanings of operations on whole numbers. * When we divide one number by another, we may get a quotient that is bigger than the original number, smaller than the original number or equal to the original number. | **Essential Questions:** (Questions which frame ongoing and important inquires about the big ideas. They are written for students and used in daily instruction to help engage students in meaningful thinking.)   * What would our society be like without decimals? * How are fractions useful? |

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| **Acquisition (\*Mostly assessed through traditional summative assessments)** | |
| **Knowledge:** Key basic concepts, facts, and key terms (written in phrases) students should be able to recall independently.  *Students will know …*   * The standard algorithm for multiplying and dividing whole numbers * The standard algorithms for adding, subtracting, multiplying and dividing multi-digit decimals * That fractions can be represented in multiple ways visually   **Key Academic Vocabulary:**   * Algorithm * Reciprocal * Greatest Common Factor * Least Common Multiple | **Skills:** The discrete skills and process students should be able to use independently.  *Students will be skilled at:*   * Dividing multi-digit numbers using the standing algorithm. * Fluentlyadding, subtracting, multiplying and dividing multi-digit decimals using the standard algorithms. * Computing quotients of fractions * Dividing fractions by fractions using visual models equations. * Computing the greatest common factor within 100. * Computing the least common multiple of two or more numbers less than or equal to 12. * Applying the distributive property to solve problems. * Applying prime factorization to solve problems. |
| **Knowledge Questions:**   * When I divide a fraction by a fraction what do the dividend, quotient and divisor represent? * What kind of models can I use to show solutions to word problems involving fractions? * How do mathematical operations relate to each other? * How do I know which operation to use (+, -, x, ÷)? * Why does the process of invert and multiply work when dividing fractions? * When or why would it be helpful to know the least common multiple or greatest common factor of a set of numbers? | |

**Resource Suggestions:**

**CCSS Vocabulary:** [**www.ncesd.org/page/983**](http://www.ncesd.org/page/983)

**Drills:** [**www.learningfarm.com**](http://www.learningfarm.com)

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| **Standard(s)** | **Link** |
| 6.NS.1 | <http://learnzillion.com/lessons/3541-divide-a-whole-number-by-a-fraction>  <https://www.illustrativemathematics.org/6.NS.A> |
| 6.NS.2 | <http://learnzillion.com/lessons/3338-divide-with-twodigit-divisors-using-base-ten-blocks>  <https://www.illustrativemathematics.org/6.NS.B.2> |
| 6.NS.3 | <http://learnzillion.com/lessons/3034-add-decimals>  <https://www.illustrativemathematics.org/6.NS.B.3> |
| 6.NS.4 | <http://learnzillion.com/lessons/2393-answer-word-problems-by-listing-factor-pairs>  <https://www.illustrativemathematics.org/6.NS.B.4> |
| 6.NS.MA.4a | <http://www.thinkfinity.org/api-search-standard-detail.jspa?state=MA&grade=6&subject=Mathematics&pageRange=0&mode=dropdown&standard=667681156> |

**Technology (Videos)**

**Khan Academy** [**http://www.khanacademy.org/math/cc-sixth-grade-math**](http://www.khanacademy.org/math/cc-sixth-grade-math)

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| **Standard** | **Link** |
| 6.NS.1 | <http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-arithmetic-operations/cc-6th-dividing-fractions>  <http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-arithmetic-operations/cc-6th-div-whole-fractions> |
| 6.NS.2, 6.NS.3 | <http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-arithmetic-operations/cc-6th-division>  <http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-factors-and-multiples/cc-6th-distributive-property> |
| 6.NS.3 | <http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-arithmetic-operations/cc-6th-add-sub-decimals>  <http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-arithmetic-operations/cc-6th-multiplying-decimals> |
| 6.NS.4 | <http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-factors-and-multiples/cc-6th-lcm>  <http://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-factors-and-multiples/cc-6th-gcf> |

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| **GO MATH PROGRAM (STANDARDS: 6NS1;** 6NS2; 6NS3; 6NS4; 6NS(MA)4a) |

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| **Standard Covered** | **Lesson Number** | **Lesson Title** |
| 6NS2 | 1.1 | Divide Multi-Digit Numbers |
| 6NS4 | 1.2 | Prime Factorization |
| 6NS4 | 1.3 | LCM |
| 6NS4 | 1.4 | GCF |
| 6NS4 | 1.5 | Apply GCF |
| 6NS3 | 1.6 | Add & Subtract Decimals |
| 6NS3 | 1.7 | Multiply Decimals |
| 6NS3 | 1.8 | Divide Decimals by Whole Numbers |
| 6NS3 | 1.9 | Divide With Decimals |
| 6NS6C | 2.1 | Fractions & Decimals |
| 6NS6C | 2.2 | Compare & Order Fractions & Decimals |
| 6NS4 | 2.3 | Multiply Fractions |
| 6NS4 | 2.4 | Simplify Factors |
| **6NS1** | **2.5** | **Model Fraction Division** |
| **6NS1** | **2.6** | **Estimate Quotients** |
| **6NS1** | **2.7** | **Divide Fractions** |
| **6NS1** | **2.8** | **Model Mixed Number Division** |
| **6NS1** | **2.9** | **Divide Mixed Numbers** |
| **6NS1** | **2.10** | **Fraction Operations** |

**NOTES:**

> 19 Go Math lessons correspond to WPS Unit Guide 1

**> Lessons in bold print correspond to priority standards**

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| **> MA.6.NS.4a (Apply number theory concepts, including prime factorization and relatively prime numbers, to the solution of problems) is covered by Go Math lesson 1.2** |

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| **> lessons in red correspond to standards for WPS unit 2, but also correspond appropriately to the content in Go Math ch. 2** |

**MATH IN FOCUS**

Chapter 1 and Chapter 3 (8 lessons correspond to Unit 1)

Chapter 1 Opener Positive Numbers and the Number Line Foundation for 6.NS.4

1.2 Prime Factorization 6.NS.4

1.3 Common Factors 6.NS.4

**(NOTE: Lesson 1.4 and Lesson 1.5 correspond to WPS Module 2)**

Chapter 3 Opener Multiplying and Dividing Fractions and Decimals Foundational for 6.NS.1, 6.NS.2, 6.NS.3

3.1 Dividing Fractions 6.NS.1

3.2 Multiplying Decimals 6.NS.3

3.3 Dividing Decimals 6.NS.2, 6.NS.3

3.4 Real-World Problems: Fractions and Decimals 6.NS.1, 6.NS.3